Application No. 10/672,529
Reply to Office Action mailed August 25, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended):   An active noise control system for controlling induction noise of an internal combustion engine, comprising:

a speaker; and

a controller for generating a control signal that drives said speaker, wherein said signal is based on at least one current vehicle operating condition, a determination of a first sound pressure for each order of sound generated by said engine during a run up of said engine and a determination of a second sound pressure computed for each of a plurality of operating conditions of said engine, wherein said signal controls each of order of sound generated by said engine independently to drive said speaker to generate an audio output to control said noise and wherein said signal is not fed back to said controller for modification of said signal to thus form an open loop system.

Claim 2 (original):   The system according to claim 1, wherein said signal is also based on a frequency response of a microphone and a speaker used in computing said first and second sound pressures.

Claim 3 (original):   The system according to claim 1, wherein said vehicle operating conditions are obtained by a transceiver from a vehicle databus.

Claim 4 (original):   The system according to claim 1, wherein said signal includes a gain factor for attenuating said sound.

Claim 5 (original):   The system according to claim 1, wherein said signal includes applying a gain factor for enhancing said sound.

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Claim 6 (original): The system according to claim 1, wherein said signal includes a correction factor for each of said operating conditions.

Claim 7 (original): The system according to claim 1, further including an amplifier for amplifying said signal.

Claim 8 (original): The system according to claim 1 wherein said controller decomposes said first and second sound pressures and generates look-up tables.

Claim 9 (original): The system according to claim 1 wherein said controller utilizes an algorithm that uses a Nyquist criterion.

Claim 10 (original): The system according to claim 1 further including a time delay between said engine operating conditions.

Claim 11 (currently amended): An active noise control system for controlling induction noise of an internal combustion engine, comprising:

a speaker; and

a controller for generating a control signal that drives said speaker, wherein said signal is based on at least one current vehicle operating condition, a determination of a first sound pressure for each order of sound generated by said engine during a run up of said engine, a determination of a second sound pressure computed for each of a plurality of operating conditions of said engine, and a determination of a frequency response of a microphone and speaker used in determining said first and second sound pressures, wherein said signal controls each of order of sound generated by said engine independently to drive said speaker to generate an audio output to control said noise and wherein said signal is not fed back to said controller for modification of said signal to thus form an open loop system.

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Claim 12 (original): The system according to claim 11, wherein said vehicle operating conditions are obtained by a transceiver from a vehicle databus.

Claim 13 (original): The system according to claim 11, wherein said signal includes a gain factor for attenuating said sound.

Claim 14 (original): The system according to claim 11, wherein said signal includes applying a gain factor for enhancing said sound.

Claim 15 (original): The system according to claim 11, wherein said signal includes a correction factor for each of said operating conditions.

Claim 16 (original): The system according to claim 11, further including an amplifier for amplifying said signal.

Claim 17 (original): The system according to claim 11, wherein said controller decomposes said first and second sound pressures and generates look-up tables.

Claim 18 (original): The system according to claim 11, wherein said controller utilizes an algorithm that uses a Nyquist criterion.

Claim 19 (original): The system according to claim 11, further including a time delay between said engine operating conditions.

Claim 20 (currently amended): An active noise control system for controlling induction noise of an internal combustion engine, comprising:

a speaker located within an air induction system;

a controller for generating a control signal that drives said speaker, wherein said signal is based on at least one current vehicle operating condition, a determination of a first sound pressure for each order of sound generated by said engine during a run up of

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said engine, a determination of a second sound pressure computed for each of a plurality of operating conditions of said engine, and a determination of a frequency response of a microphone and speaker used in determining said first and second sound pressures, wherein said signal controls each ef order of sound generated by said engine independently to drive said speaker to generate an audio output to control said noise <u>and wherein said signal is not fed back to said controller for modification of said signal to thus form an open loop system</u>;

a sensor for providing a reference signal indicative of a camshaft position, wherein said reference signal is utilized in determining said first pressure; and

a transceiver for providing said at least one current vehicle operating condition to said controller.

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2002/0097884).   Claims 9 and 18 are rejected under 35 USC 103(a) as being unpatentable over Pfaff (EP 0479367A2) in view of Kuo (US Patent No. 5,940,519). These rejections are respectfully traversed in view of the current amendment.

Independent claims 1, 11 and 20, as amended, set forth an active noise control system in which the control signal is not fed back to the controller for modification, thus forming an open loop system as shown in Figure 1 and described in the as filed specification beginning on page 5, line 16, for example.

The Pfaff patent, by contrast, discloses a closed loop system for attenuating engine noise. By way of example, Pfaff discloses the use of an error microphone 30 (Figure 1) to develop an analogue $ERROR_1$ feedback signal. The $ERROR_1$ feedback signal is directed back to the controller 26 and is used to minimize induction noise propagating out of the engine 10 (page 4, lines 25-30).

Pfaff does not disclose or suggest the use of open loop active noise control systems as set forth in the claims. As such, there would be no reason why one of ordinary skill in the art, who was faced with the same problems confronting the applicant and who had no prior knowledge of applicant's claimed structure, would consult Pfaff, either alone or in combination with another patent. As such, it is believed that amended independent claims 1, 11 and 20, and dependent claims 2-10, 12-19 are not rendered obvious by Pfaff. Therefore, it is believed that the rejections have been overcome.

Since the applicant has fully distinguished the patents cited in the Office Action, it is respectfully submitted that in regard to the above amendments and remarks that claims 1- 20 are allowable and that the application should be allowed. Should the Examiner be of the view that an interview would expedite consideration of this Amendment or of the application at large, request is made that the Examiner telephone the applicant's attorney at (732) 321-3193 in order that any outstanding issues be resolved. While it is believed

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